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USGS Long-Term Archive
Preservation, Access and Distribution

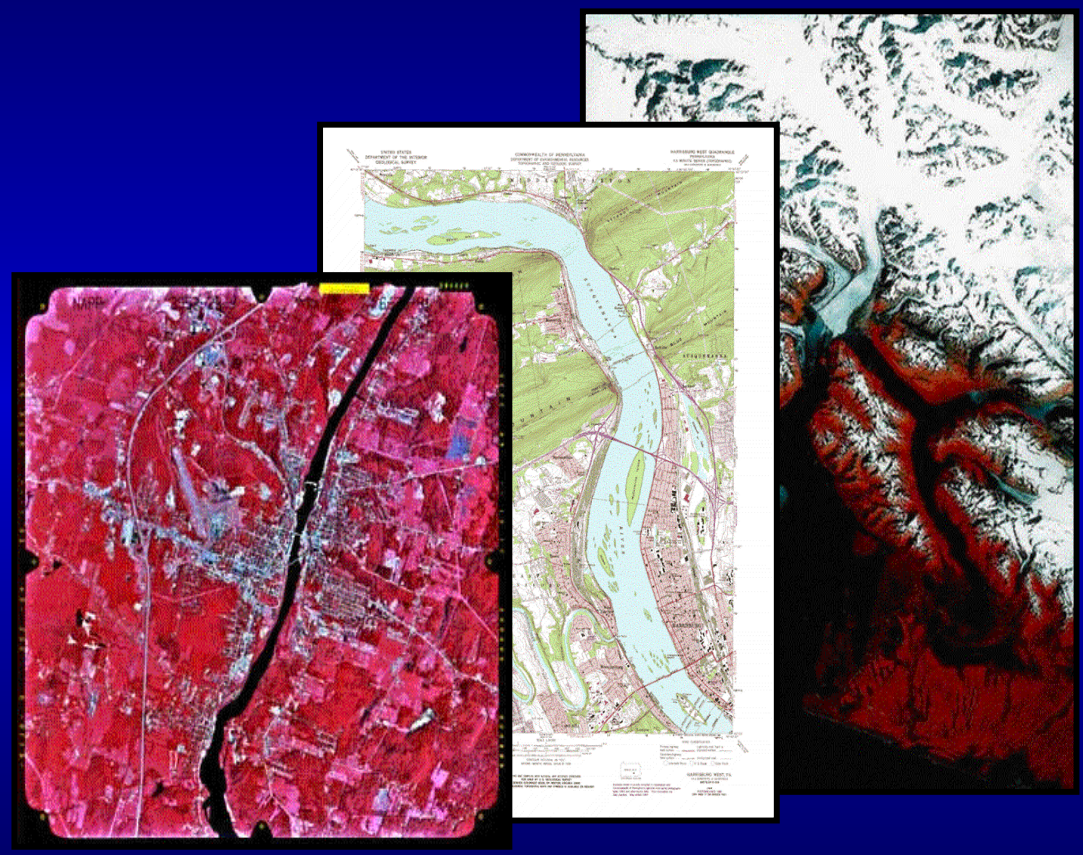
LPDAAC Science Advisory Panel Meeting

February 8, 2006

U.S. Department of the Interior
U.S. Geological Survey

USGS Long-Term Archive (LTA)

- Aerial
- Cartographic
- Satellite
  - Multi-
    - Temporal
    - Spectral
    - Spatial
    - Sensor



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USGS LTA -- Film and Digital

Film Archive

- 1939 to Present
- 24 Major Collections
- Multiple film formats/sizes
- Over 8.6 million frames

Digital Archive

- 1972 to Present
- Over 1 Petabyte of data
- Over 21 million files

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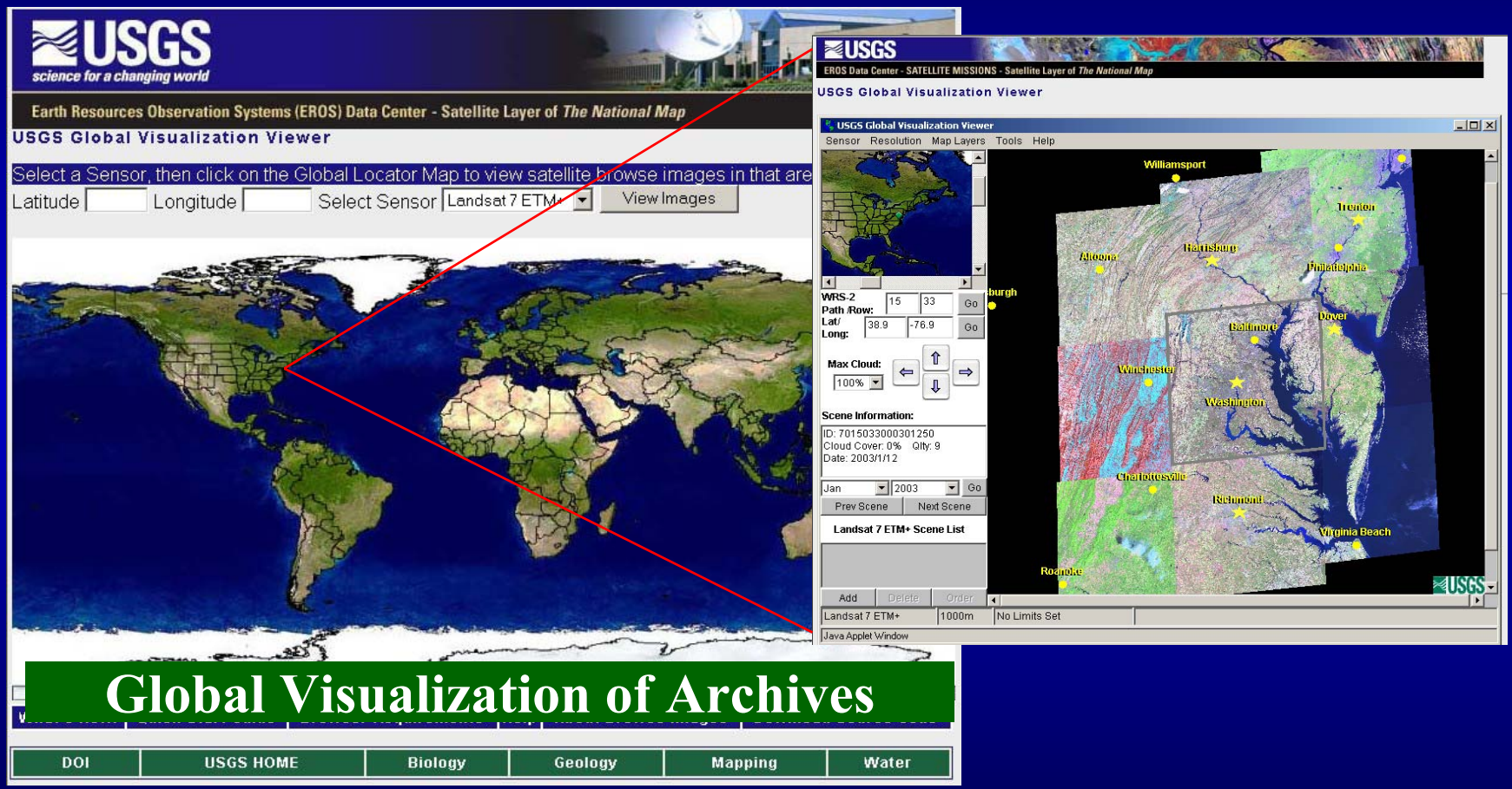
USGS LTA -- Data Access/Distribution



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USGS LTA -- Data Access/Distribution

Earth Explorer

http://earthexplorer.usgs.gov

Global Visualization Viewer

http://glovis.usgs.gov/

The National Map

http://nationalmap.usgs.gov

Seamless

http://seamless.usgs.gov

NASA DAAC EDG

http://lpdaac.usgs.gov/main.asp

Web Mapping Services

http://gisdata.usgs.net

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National Satellite Land Remote Sensing Data Archive

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NSLRSDA Mandate

- **Established by the Land Remote Sensing Policy Act of 1992 (Public Law 102-555)**

  "It is in the best interest of the United States to maintain a permanent, comprehensive Government archive of global Landsat and other land remote sensing data for long-term monitoring and study of the changing global environment. "

  "DOI shall provide for long-term storage, maintenance, and upgrading of a basic, global, land remote sensing data set...and shall follow reasonable archival practices to assure proper storage and preservation of the basic data set and timely access for parties requesting data."

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NSLRSDA Responsibilities

- Populate the Archive
- Preserve the Archive -- HOLD in TRUST
- Provide Access to the Archive
- Distribute Products from the Archive
- Manage and Improve the Archive
- Seek Advice in the Management of the Archive
  - Archive Advisory Committee

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Archive Advisory Committee 1998 to the Present

Objectives[1]

- Assist in defining and accomplishing the NSLRSDA's archiving and access goals to carry out the requirements of the Land Remote Sensing Policy Act;
- Advise the USGS/EDC on priorities of the NSLRSDA's tasks; and,
- Provide interdisciplinary guidance and serve as a resource to USGS/EDC on issues of archiving, data management, science, policy, and public-private partnerships.

[1] U.S. Department of the Interior Charter; National Satellite Land Remote Sensing Data Archive Advisory Committee, signed March 24, 1998

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Archive Advisory Committee

Charge

- Determine what the preservation priorities are in an era of limited resources, and

- Commit yourselves to advocate the highest practical level of authenticity and integrity in data stewardship.

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Committee Work Products

- **White Papers**
  - Policy and terms of reference, January 1999
    - Archive is an inherently government function
    - Clearly defined levels of processing
  - Restricted data access, April 2000
    - May acquire restricted data with a sunset clause on use restrictions
    - Negotiate with commercial vendors unconditional access to, and use of, restricted data for disasters and humanitarian efforts

- **Recommendations**
  - Establish a data policy for the Archive -- Drafted Archive Policy
  - Expand relationship to land remote sensing data users - increase visibility
  - Engage the private sector in a more substantive and meaningful way
  - Define data acceptance criteria -- Data Sieve

http://edc.usgs.gov/archive/nslrsda/index.html

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National Satellite Land Remote Sensing Data Archive

Data Sieve Recommendations

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Data Sieve Key Points

- "It seems unlikely that adequate fiscal resources will be made available to NSLRSDA to effectively address all demands that are placed on it."

- "The Data Sieve subcommittee therefore recommends the following additional considerations to evaluate whether specific data sets should be considered for inclusion in the NSLRSDA."

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Recommendations

- **High priority** consideration be given to the **long-term observations** that provide consistent, repetitive coverage over extended periods of time (e.g. Landsat)

- **Experimental data** sets be viewed as **"special collections"** primarily for historical interest with less ongoing science value than long-term systematic measurements (e.g. EO-1)

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Recommendations, cont'd.

- <1m to 10m spatial resolution data are managed by the commercial industry
- 1km to 10km spatial resolution data are managed by NOAA

Therefore:

- 10m to 1km spatial resolution (moderate resolution) should be the primary archival goal of NSLRSDA

> "…NSLRSDA [should] focus on compiling and making available the long-term, global records of land observations from the moderate resolution observatories."

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Recommendations, cont'd.

- NSLRSDA should set a goal to acquire and maintain full global observation records:

Spatial Resolution	Temporal Resolution	Sources	Record Length
1 km to 100 m	Data to produce 10-day cloud-free composites	AVHRR MODIS NPP VIRRS	1982 - present
100 m to 10 m	Quarterly cloud-free (including data adequate to produce quarterly composites as needed)	Landsat SPOT ASTER IRS	1972 - present

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USGS Archive Appraisal Process

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U.S. Department of the Interior
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Background

- Appraisals Part of the Records Lifecycle
  - Create [Acquire]
  - Use and Maintain [Access and Preservation]
  - Final Disposition [Save, Transfer or Destroy]
- Addressed via Records Management Processes
  - Appraisal
  - Accession
  - Arrangement
  - Description
  - Access
  - Reference
  - Preservation
  - Disposition
  - Outreach

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Rationale

- Need to Confirm Programmatic Relevance
  - Existing Holdings
    - Historically Accepted Collections w/o Documentation
  - Offered or Solicited Collections
  - Mission and Program Alignment
  - Budgetary Concerns
    - Allocate Resources to Collections Aligned with our Mission and Mandates

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Process

- USGS and External Scientists Engaged
  - Secure Science Support per Each Collection Appraisal
- Appraisal Team
  - Archive Personnel
  - Collections Experts
  - Science Members
- Background Information Assembled
- Appraisal Conducted & Documented
- Recommendations Generated
    - Final Recommendations Must Include Science View
- Stakeholders Briefed
- Recommendations Acted Upon

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Final Messages

- The USGS is the Nation's archive for land remote sensing data, and we are committed to achieving our mandate by taking advantage of our:
  - Facilities
  - Staff
  - IT Resources
  - Technology Improvements
  - 30 years of experience
  - Partnerships, e.g., NASA

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- **USGS, as the Nation's archive for land remote sensing and other Earth surface data, is:**

Committed to long-term preservation, management, access and distribution today, and for generations to come.

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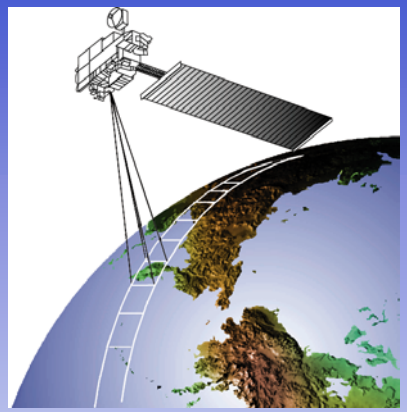
Land Remote Sensing

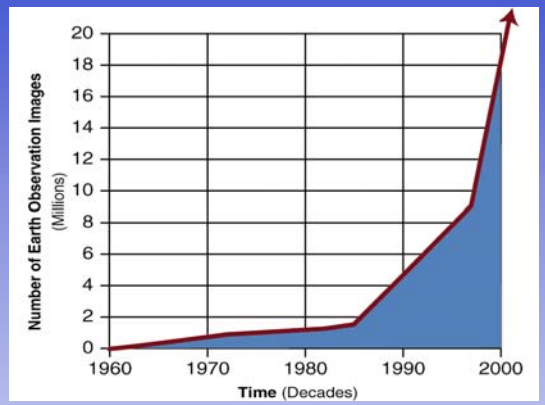
"A National Commitment"

Earth Observation Satellites



- Declassified Systems
- Landsat 1-5
- NOAA - NPOES
- Shuttle Radar
- Landsat 7 (1999)
- NASA-EOS (2000)
- High Resolution Systems

USGS National Archive Challenge



- Preserve
- Provide Access
- Process
- Reproduce
- Distribute

Hold in Trust

Data Applications

- Land Cover
- Fire Sciences
- DOI Land Management
- Natural Hazards
- Coastal Zones
- Environmental Monitoring

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Back-up Slides

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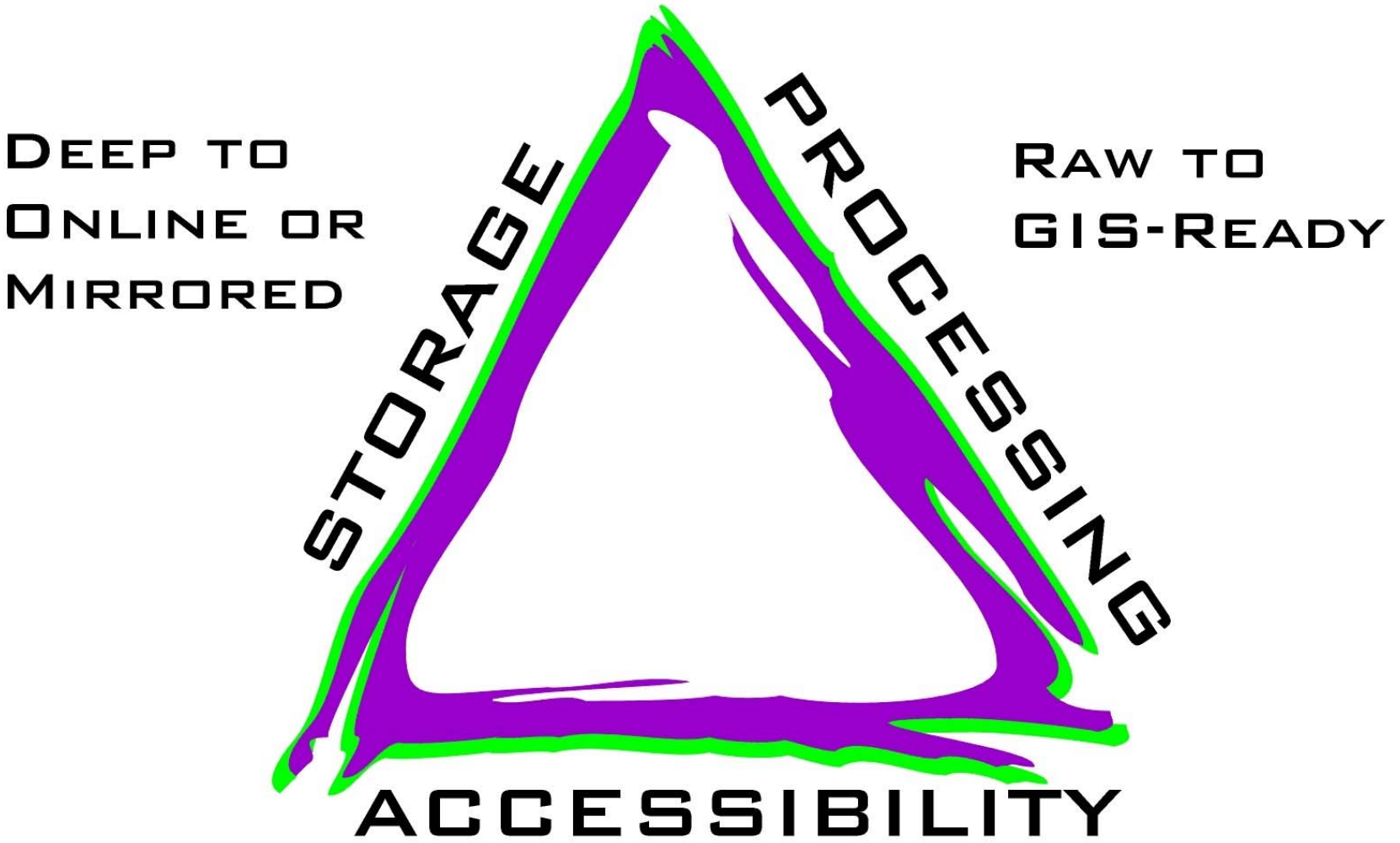
Philosophy - Three Sided View



Levels of Service -- Requirements

- Levels of Service
  - STORAGE Definitions
  - PROCESSING Definitions
  - ACCESSIBILITY Definitions
    - See Handout
- Just Starting to Gain Attention

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Process -- Appraisal Tools

- Scientific Records Appraisal Tool
  - http://edc2.usgs.gov/government/RAT/tool.asp
  - Used to Document the Appraisals
  - 70+ Questions - Topical Areas:
    - Relevancy to USGS Mission
    - Adherence to USGS Policy
    - Physical Descriptions
    - Metadata Availability, Accuracy & Completeness
    - Cost / Benefit Analysis
      - Relative Costs
        - Actual or Perceived
        - High / Medium / Low

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Charter III Committee Members 2004 - 2006

Co-Chairs

- Prof. Joanne Gabrynowicz, UM National Remote Sensing & Space Law Center
- Dr. Samuel Goward, University of Maryland

Members

- Mr. David Brown, Chief, National Archives of Canada
- Ms. Amy Budge, University New Mexico, EDAC
- Mr. Gene Colabatistto, Xvionics, Inc.
- Dr. Kenneth Davidson, Director, World Climate Programme, WMO (Retired)
- Dr. Bradley D. Doorn, USDA/Foreign Agricultural Service
- Mr. Daniel Dubno, Producer and Technologist, CBS News
- Mr. James J. Frelk, NASA, Headquarters Operations
- Ms. Kass Green, President Alta Vista Company
- Mr. Dave Jones, CEO, President and Founder Storm Center Communication
- Ms. Roberta E. Lenczowski, West Executive, NGA, (Retired)
- Dr. Gerald Nelson Assoc. Prof., Affiliate, East Asian and Pacific Studies
- Mr. Herbert F. Satterlee-III, CEO, DigitalGlobe, Retired
- Dr. George A. Seielstad, John D. Odegard School of Aerospace Sciences, UND
- Dr. Darrel Williams, NASA Scientist

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Charter II Committee Members 2001 - 2003

- Mr. Hugh Bender, Texas Geographic Society
- Ms. Amy Budge, University New Mexico, EDAC
- Mr. Rick C. Crowsey, President, Crowsey Incorporated
- Dr. Kenneth Davidson, Director, World Climate Programme, WMO
- Dr. Bradley D. Doorn, USDA/Foreign Agricultural Service
- Mr. Daniel Dubno, Producer and Technologist, CBS News
- Mr. James J. Frelk, Director, Business Development, ECS
- Prof. Joanne Gabrynowicz, UM National Remote Sensing & Space Law Center
- Dr. Samuel Goward, University of Maryland
- Ms. Kass Green, President, Space Imaging Solutions
- Dr. John MacDonald, Chair, MacDonald- Dettwiler (Retired)
- Dr. Gerald Nelson Assoc. Prof., Affiliate, East Asian and Pacific Studies
- Mr. Herbert F. Satterlee, III, CEO, DigitalGlobe
- Dr. Edryd Shaw, Director General, CCRS, (Retired)
- Dr. Darrel Williams, NASA *Landsat* Scientist
- Mr. Robert S. Winokur, Pres. and COO, Earth Satellite Corporation

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Charter I Committee Members 1998 - 2000

- Ms. Prudence Adler, Assc. Dir., Research Libraries
- Dr. Marion Baumgardner, Purdue University (Retired)
- Mr. Glenn Bethel, USDA/Farm Service Agency
- Dr. Grady Blount, Texas A&M
- Ms. Amy Budge, University New Mexico, EDAC
- Mr. John Copple, CEO, Space Imaging
- Dr. Kenneth Davidson, NOAA
- Prof. Joanne Gabrynowicz, University of North Dakota
- Ms. Kass Green, President, Pacific Meridian
- Mr. Joseph Harroun, Cargill
- Dr. Annette Krygiel, National Defense University (Retired)
- Dr. John MacDonald, Chair, MacDonald - Dettwiler (Retired)
- Dr. George Robinson, General Counsel Smithsonian (Retired)
- Dr. Edryd Shaw, Director General, CCRS
- Mr. Paul Tessar, Boulder County, CO
- Dr. Darrel Williams, NASA *Landsat* Scientist

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Physical Archive

- 39,000 sq. ft. environmentally-controlled space
- Temperature and humidity alarmed monitors
- Fire-proof vault for system critical tapes
- Concrete walls and ceiling
- Incipient fire detection/fire suppression
- Water detectors
- Human walk-throughs
- 24-hour security detail

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Archiving Requirements

- Maintaining data integrity
  - Ensure adherence to Federal regulations – NARA
    - NARA Code of Federal Regulations Chapter 12 of Title 36, part 1,234-Electronic Records Management
  - Security
    - General Accounting Office (GAO) reviews in 1989 and 1990
  - Environmental controls
    - Temperature
    - Humidity
  - Media management
    - Magnetic tape storage and handling, National Media Labs, June 1995
  - Data migration

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